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LABORATORY INDICATORS OF EDENTIA WITH DENTAL IMPLANTATION***E.R. Sarboev****Researcher Tashkent Medical Academy, Uzbekistan*

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Abstract: Adentia occurs in 40-75% of the adult population, and more than 25% of people over 80 years of age do not have a single natural tooth in their mouth. In case of secondary partial adentia, due to a violation of the integrity of the dentition during eating, the mucous membrane of the oral cavity is injured, and the remaining teeth are overloaded. Over time, tooth extraction leads to bone atrophy, which is accompanied by disruption of the supporting and homeostatic functions of bone tissue. With defects in the dentition, the anatomical and topographic proportions of the facial skeleton change, osteoporosis, atrophy of the bone, masticatory and facial muscles progress, dysfunction of the temporomandibular joint occurs, which requires restoration of the dentition.

INTRODUCTION

Dental implantation is a surgical intervention aimed at introducing an artificial support into the bone of the upper or lower jaw for further rational treatment of adentia. Over the past 30 years of its development, dental implantation has become the main method of treating partial and complete adentia of the dental system [6]. Numerous studies have led to the emergence of various methods for installing dental implants (DI), materials for their manufacture, variations in their shapes and purposes [7]. At the moment, there are many models of DI from different manufacturers in the world, differing in their shape, physical and chemical characteristics. A study of the active surfaces of various brands of dental implants showed a variety of their physicochemical properties, which are influenced by a large selection of raw materials used, in the form of different grades of Ti, methods of processing and storage of finished DIs [8]. DIs introduced into the oral cavity are highly biocompatible, but the problem of their

influence on the metabolic systems of the oral cavity remains controversial. In dental practice, oral fluid (OF) is of great interest for study. The oral cavity is a biological medium that washes the entire oral cavity, interacting with mucous membranes, teeth and orthopedic structures [9, 10, 11]. Oral fluid affects all components of the dental system with which it comes into contact, being an aggressive environment for them that can change their physical and chemical parameters. New components of the dental system are capable of changing the composition of oral fluid, which actualizes the use of its biochemical study to determine the links in the pathogenesis of oral diseases at the molecular level and substantiate the possibilities of their metabolic correction [2, 12, 13]. Thus, changes in the enzymatic activity of oral fluid can be influenced by metal ions used for the manufacture of dental implants and their orthopedic components, which can lead to changes in protective, mineralizing, digestive and other properties, which can adversely affect both the dental system and the entire body in general. A little-studied process occurring in the oral cavity is the process aimed at the production of free radicals in the oral fluid, as well as its connection with the activity of antiradical defense enzymes [14]. The functioning of the prooxidant -antioxidant system plays an important role in maintaining homeostasis of the whole organism and the oral cavity in particular [15]. Surgical interventions aimed at implantation of a dental implant can cause oxidative stress. The state of the prooxidant -antioxidant system can be influenced by changes in the ionic composition of the oral fluid, surgical interventions aimed at the introduction of dental implants, and the process of osseointegration of dental implants [20]. In modern literature there is sufficient data on the effect of fixed prosthetics on the metabolic systems of the oral cavity, meanwhile, dental implantation today is the main method of treating partial edentia, so the purpose of this study was to study the electrolyte composition and the state of the prooxidant -antioxidant system of the oral fluid after treatment using dental implantation

RESULTS

A study of the electrolyte composition of the oral fluid of patients showed that the development of edentia was accompanied by a significant increase in the content of sodium and iron ions in the oral fluid, which is possible due to injury to the tissues of the oral cavity with traces of blood entering the mixed saliva (Table 1). Despite the fact that samples with the slightest signs of the presence of blood in mixed saliva were excluded from the study, it can be assumed that there were microtraumas, which would only result in a change in the chemical composition of the biofluid without obvious external changes in the oral fluid. An increase in iron content is especially unfavorable for the homeostasis of the oral cavity due to the active participation of this metal ions in redox processes with the generation of free radicals. Thus, partial edentia with the absence of 1-3 teeth was accompanied by an increase in the

content of sodium ions by 5.1 times and the content of iron ions by 11.3 times compared with the control group. The content of sodium and iron ions in the oral fluid in patients with the absence of 4-6 teeth did not differ statistically significantly from similar indicators in patients with the absence of 1-3 teeth and was increased compared to the control value by 3.4 and 5.5 times. At the same time, the content of potassium ions, phosphate anions and chlorides in the oral fluid of patients in all groups did not differ significantly from the control figures. Only the concentration of calcium ions in the oral fluid of patients with edentulous 4-6 teeth was slightly reduced compared to the same indicator in the group of healthy volunteers - by 20-22%, both before and after treatment. Interestingly, a number of studies have shown an increase in the content of calcium ions in the oral fluid of patients with partial edentia, probably of a compensatory nature [24]. We assume that in our case, the short duration of existence of partial edentia did not allow the entire complex of metabolic changes characteristic of this pathological condition to fully develop. After dental implantation in patients with partial edentia, repeated sampling of oral fluid revealed a significant decrease in iron content - to control values in both studied subgroups of patients, which is certainly prognostically favorable. The results obtained are most likely associated not only with the restoration of the integrity of the dentition, but also with the implementation of hygienic measures in the oral cavity that accompany surgical treatment. The concentration of sodium ions in the oral fluid did not decrease, which may be due to the different dimensions of these indicators. It is likely that with a slight ingress of blood into the mixed saliva of the oral cavity, the concentration of sodium, which is the main cation in the blood plasma, increases sharply, while iron ions do not have time to accumulate and only as a result of prolonged hidden bleeding their concentration can increase significantly. Determination of the functioning parameters of the enzyme component of antiradical protection and the content of products of oxidative modifications of biomolecules showed the development of an imbalance in the pro- / antioxidant system. SOD activity in patients with partial edentia was lower than control values by 30.4% in the absence of no more than 3 teeth and by 38.1% in the absence of 4-6 teeth. CAT activity in patients in the study groups before treatment, on the contrary, exceeded the values in the control group. Thus, CAT activity in subgroups 2a and 3a was higher than the same indicator in the control group by 51.3% and 13.2%, respectively. Low values of GPO activity were determined - 4-5 times lower than control in patients with partial edentia. At the same time, GR activity was lower than that of healthy volunteers by 29.4% only in the absence of 4-6 teeth in patients. The content of TBA-reactive products, which was assessed by the TBC value, increased significantly both in edentulous patients with the absence of 1-3 teeth, and in the absence of 4-6 teeth. In the first case, TBC exceeded the same indicator in the control group by 1.9 times, and in the second - by 2.6 times, but no statistically significant differences were recorded between these subgroups. 6

months after dental implantation, significant positive changes in the prooxidant -antioxidant system were recorded in the oral fluid of all studied patients. Thus, the level of TBC in the oral fluid of patients with edentulous 1-3 teeth decreased to the level of the same indicator in the test subjects of the control group, and in patients with edentulous 4-6 teeth it was still higher than the control, but decreased by 25.6% compared with values of subgroup 3a. This is probably due not only to the greater severity of the pathological process, but also to the longer duration of its course in this subgroup.

In addition, it should be noted that a decrease in the level of products of oxidative modifications, the accumulation process of which usually takes a long time, in the oral fluid is also associated with a decrease in the concentration of iron ions after dental implantation to the level of the control group. The activity of antiradical defense enzymes did not undergo such significant changes. Thus, the activity of SOD and GR after dental implantation did not change statistically significantly in both subgroups of patients. The activity of CAT in the oral fluid in subgroup 2b decreased by 52.0% compared to the value of this indicator in subgroup 2a. This may be due to a decrease in the production of hydrogen peroxide and other reactive oxygen species and, accordingly, a decrease in the need for catalase to function. GPO activity after dental implantation increased in subgroup 2b by 2.1 times and in subgroup 3b by 1.7 times, which reflects the partial restoration of the protective potential of the oral fluid.

CONCLUSIONS

The results obtained reflect metabolic changes in the oral fluid of patients with partial edentia after dental implantation, aimed at maintaining adequate homeostasis, in particular, a tendency towards normalization of the functioning of the prooxidant -antioxidant system and electrolyte metabolism is shown. The literature of recent years has shown that the treatment of partial edentia using removable or fixed prosthetics is accompanied by an even greater increase in oxidative processes. This is due to direct contact of oral fluid with the material of the prosthesis, including heavy metals and polymers. In the structure of the latter there remains a certain amount of non-polymerized monomers, which under certain conditions are capable of diffusion and the manifestation of toxic properties by the polymer. In the case of using implants for the treatment of edentia, such changes are less likely, since the main material of the implant does not directly contact the oral fluid, however, they are also not excluded, but to confirm or refute them, further studies of metabolism in the oral fluid at a later date are necessary.

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